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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Kazuyuki Matsumoto et al.)
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TITLE: METHOD AND APPARATUS FOR CUTTING A SHEET-SHAPED
MATERIAL

THE ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231

AMENDED CLAIMS

1. (currently amended) A method for cutting a synthetic resin sheet for a lens, which is to be carried out immediately after a heating step of a manufacturing process of the synthetic resin sheet, in which a forming die, ultraviolet ray curing type resin applied thereon and a substrate sheet placed on said ultraviolet ray curing type resin are supplied in a predetermined direction into a space between a pair of nip rollers, to manufacture the synthetic resin sheet having a first pair of opposite side portions extending substantially perpendicularly to said predetermined direction and a second pair of opposite side portions extending substantially in parallel with said predetermined direction, said method comprising the steps of:

(a) heating the synthetic resin sheet;

(b) measuring an elevated temperature of the synthetic resin sheet immediately before cutting;

(c) determining an expected expansion of the synthetic resin sheet based on said elevated temperature and a reduced temperature that the synthetic resin sheet is to be cooled to, so as to satisfy the equation $\Delta L = L\alpha(t-t_0)$ wherein, ΔL is the expected expansion of the synthetic resin sheet, α is a coefficient of linear expansion for the synthetic resin sheet, t is the elevated temperature, t_0 is the reduced temperature, and L is a length of the synthetic resin sheet at the reduced temperature; and

(d) cutting said first pair of opposite side portions of the synthetic resin sheet, immediately after the heating step, to compensate for said expected expansion of the synthetic resin sheet when cooled to said reduced temperature; and then

(e) cutting said second pair of opposite side portions of the synthetic resin sheet, to compensate for said expected expansion of the synthetic resin sheet when cooled to said reduced temperature.

2. (previously amended) The method as claimed in claim 1, wherein:

said step (b) comprises measuring the elevated temperature of portions of the synthetic resin sheet, which correspond to a plurality of prescribed cutting lines parallel to which the synthetic resin sheet is to be cut;

said step (c) comprises determining the expected expansion of each of said portions of the synthetic resin sheet; and

said step (d) comprises cutting the synthetic resin sheet parallel to said prescribed cutting lines to compensate for said expected expansion of each of said portions of the synthetic resin sheet when cooled to said reduced temperature.

3. (withdrawn) An apparatus for cutting a sheet-shaped material, comprising:

a cutting unit having a pair of blades;

a temperature sensor for measuring temperature of a sheet-shaped material heated;

a computing unit for calculating expansion of the sheet-shaped material based on said temperature measured by said temperature sensor and a room temperature to output a signal; and

a supply unit for supplying the sheet-shaped material into said cutting unit based on said signal from said computing unit.

4. (withdrawn) The apparatus as claimed in claim 3, wherein:

said temperature sensor has a function of measuring the temperature of portions of the sheet shaped-material, which correspond to a plurality of prescribed cutting lines along which the sheet-shaped material is to be cut;

said computing unit has a function of determining expansion of each of said portions of the sheet-shaped material to output signals for said portions; and

said supply unit has a function of supplying the sheet-shaped material into said cutting unit based on said signals for said portions from said computing unit.